

## Completed Return on Investment Project Case Study

United States Department of Energy  
Office of Environmental Management  
Fact Sheet

### Nitric Acid Recycling System

Los Alamos National Laboratory

#### Original Problem

The allowable level of nitrates in water was reduced, and the Plutonium Facility uses lots of nitric acid in their work. Without a method for reducing the amount of waste nitric acid, an expensive process to degrade nitrates on site might have been necessary to maintain compliance with the outfall permit.

#### The Project Solution

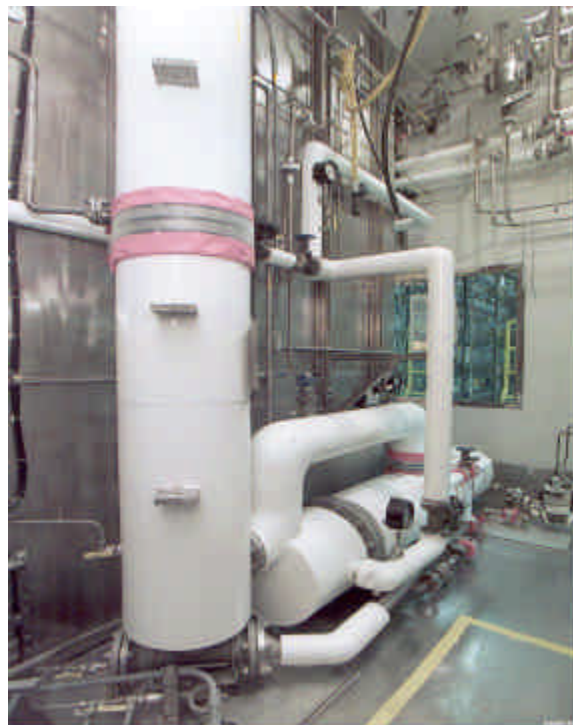
A small distillation column was installed at the Plutonium Facility to separate nitric acid from water and residual salts along a gradient. These salts are later stabilized by cementation at the Plutonium Facility. The staff can reclaim concentrated nitric acid from the bottom of the column for reuse on site. Pure water is removed from the top of the distillation column. All of the plutonium and other actinides are recovered for reuse from the liquid in the distillation column.

#### Value of Improvement

The Plutonium Facility now purchases about 80% less new concentrated nitric acid than before the project was implemented. The distillation column decreases the volume of waste nitric acid contaminated with plutonium by over 99%. Annual cost savings exceed \$2.5 million. This project won a White House Closing the Circle Award in 2002.

#### Lifecycle Waste Reduction

Lifecycle Waste Reduction	99% of waste nitric acid
Commencement Date	2002
Project Useful Life (Years)	10



#### DOE Monetary Benefits

Total Project Cost	~\$2,000,000
Lifecycle Savings	>\$2.5 million / year
Return on Investment	128%

#### Benefits At-A-Glance

- About 99% of nitric acid waste has been eliminated.
- The nitric acid, plutonium, and other actinides can be recovered and reused.
- The concentration of nitrates in the wastewater of the outfall is reduced without any cutbacks in the number and type of experiments at the Plutonium Facility.

## **Nitric Acid Recycling System Los Alamos National Laboratory**

	<b>Summary Data</b>
Priority Area:	Waste Minimization Projects
Project Type:	Process Improvement
Total Project Cost:	~\$2,000,000
Lifecycle Savings:	~\$2.5 million per year in reduced waste disposal and nitric acid procurement.
Implementing Group:	Plutonium Facility
Benefiting Group:	Plutonium Facility
Useful Life Years:	10
Return on Investment:	128%
Lifecycle Waste Reduction:	Waste nitric acid volume was decreased by ~99%.
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